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1954

A theory of expenditure control toward ultimate naval objectives

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PREFACE

The purpose of this paper is to present a theory of expenditure analysis and control that the writer believes will prove useful to comptrollers or fiscal directors of the naval service, in overcoming the following two unsatisfactory aspects of naval management:

1. Imbalances in both manpower and material supply in related forces and operations, which result in failure to fully realize the potential strength available.

2. The practice of operating personnel at many planning levels to regard expenditure analysis and control solely as a budgetary or logistic accounting consideration, which results in failure to employ the financial or economic factor in command decisions.

The writer has concluded that these two difficulties stem from:

1. Original imbalances in budget programs because of lack of correlation with operations in planning, followed by divergence in expenditure due to lack of coordination of logistic effort along the same lines as the operations supported.

2. The lack of a method of translating expenditure or use of resources into the operations or functions as they are planned and performed by the operating forces.

The theory is not submitted as an alternate for either the present navy budget or expenditure accounting at this time. If found useful in application as a means of justifying budget requests or of classifying expenditures, such developement will itself point up the way and the extent

to which it may supplant or supplement present reporting systems.

The value of the theory lies in its possible usefulness as a comptroller technique in advising and aiding naval command in making a balanced selection of manpower, weapons and supporting material required for specific operational purposes in the most desirable and economical manner, and inefficient and economic utilization of these resources toward an assigned military objective.

Due to a limited bibliography available on this subject, the writer has based this theory on his naval experience and a contemplation of the principles and practices presented by the various speakers both military and civilian appearing during the first term of the Seminar on Comptrollership at George Washington University. These have been supplemented by interviews with officers of the Navy Comptroller's office and planning groups of the Chief of Naval Operations and Joint staff. The courtesy and consideration of all of these gentlemen is hereby acknowledged. It is desired particularly to thank Rear Admiral E. W. Clexton and Captain C. Adair of the Navy Comptroller's office for information on certain compilations of naval financial reporting and Captains W. H. Ashford, R. L. Johnson, and Commander R. J. Crowley of Naval Operations for information on operational systems planning. This is not to say, however, that these officers approve or for that matter disapprove of the theory or its exposition herewith, for both the writer is solely responsible.

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CHAPTER I

INTRODUCTION

The purpose of planning is to chart a path to an objective and by analysis to predict the obstacles and pitfalls that may be encountered, and to correlate and coordinate progress toward the objective so that the obstacles may be mitigated and the pitfalls avoided.

Due to the varied nature of naval tasks whose accomplishment lead to attainment of an objective, it is more often than not necessary to distribute the planning among personnel of different capacities, technical skills or experience. Further, since these tasks are rarely accomplished simultaneously but in successive stages which are built one upon the other, planning of some stages must wait upon earlier events or occurences. This is, of course, not always true. Under certain conditions alternatives can be planned and later executed as events advise or dictate. But even in these cases the selected alternative must frequently be modified because it is not wholly satisfactory or because even later events refuse to be controlled exactly as planned.

This division of planning among different groups at different levels and at different times resolves into planning toward secondary objectives. These secondary objectives are further subdivided, by the same process of division of planning and operating responsibility into tertiary objectives and so on down the various echeleons of staff and line.

In the development of these different divisions of planning and in the later accomplishment of the operations planned, there is danger of losing sight of the purposes of these secondary objectives. Yet the degree of success or

Chapter 1

Introduction

measure of accomplishment of the ultimate objective depends not only on the attainment of these secondary objectives but on how, when, and to what extent they are attained. As means or steps to a common end, the results of these secondary objectives are usually dependent on one another in timing and degree of accomplishment. Lack of development in one or more will prevent full utilization of the attainment of others. Conversely over attainment of one may be a waste of time and resources and when done at the expense of another the error is compounded.

In a large and widespread organization, such as the naval service, both of these dangers are ever present. The most practical defense against these dangers is the correlation of all planning and coordination of ensuing operations by relation to the ultimate purpose for which they are intended. But this correlation of planning and coordination of accomplishment is easier to conceive than to obtain. The necessity of budgeting and expending along program lines to gain the advantage of consolidation of technical skill and large scale acquisition is granted, but, this also tends to obscure the timing and volume relationships to the operations they service and consequently to the effect on the results that the operations are to obtain. In essence concentration (in support planning) down the vertical columns of the programs detracts from the view along the horizontal lines of operational usage. Similarly concentration (in operational planning) along the horizontal lines of operational implementation will blind the operator to the trends of the vertical columns with which he must merge, NOT HURDLE in his path to the objective.

In order to clarify and to synchronize the above cross relationships and thus control the effect of one upon the other, expenditure planning and

progress analysis as well as tactical or military planning and progress analysis along the horizontal lines must be established in addition to the present military cognizance down the vertical columns.

This will require both increase in centralization of control and in detail of accounting. Realizing this, the degree to which control is centralized and accounting is exacted becomes the crux of the problem. It will be necessary to steer between the Scylla of over simplification and the Charybdis of complexity and pettifogging detail.

Yet such a course must be charted because only by this means can the various programs and operations of our complex enterprise be kept in proper perspective and the components thereof adjusted to provide mutual support and prevent mutual interference.

CHAPTER II

THE THEORY OF PARALLEL PLANNING

In the naval service of the United States there are generally speaking, three types of planning and performance of function. OPERATIONAL LOGISTIC AND FINANCIAL. These, of course, can be further subdivided into the various executive and functional headings, such as Strategic, Tactical and training for Operations, Procurement, Storage and issue (including transport) for Logistic and Budget Formulation and Execution for Financial. However, the three major divisions cover the field. Operations are planned and executed. Logistic requirements are determined and providion thereof attempted. Budgets are prepared and funds apportioned. Logistics and Finance are joint, of course, in the sense that all of the essentials required to perform operations must be paid for at one time or another. The manpower, the ships, the planes, the stores, the ammunition, the shore establishment, all are derived from funds, the common denominator of our resources.

Therefore to insure the most efficient and economic attainment of the ultimate objective of the Operational plan, the three forms of planning and implementation should be paralleled and the relationship of both financial and logistic planning and implementation extend to the final purposes they support in the same manner as operational planning and execution.

But why is this essential? Cannot the military commander and his staff determine and later conduct operations by only military evaluation of the forces and materials available and required? The answer can be affirmative if the forces and materials are already more than sufficient. This will require no planning or control, just usage. Or it can be affirmative if the commander is content later to mold his plans or modify his operation to the

Chapter II

The Court in Peacetime Operations

In the moral vacuum of the United States there are numerous examples, some types of planning and participation of Courts, Constitutional Judicial and Disciplinary. These, of course, can be further subdivided into various examples and functional operations, such as Strategic, Tactical and Training for Operations, Procurement, Storage and Issue (including Disposal) for Logistic and Budget Formulation and Execution for Financial. However, the final major division covers the field. Operations are planned and executed. Logistic requirements are determined and available General Reserves. Logistics are procured and Funds apportioned. Logistics and Finance are tried, of course, in the media that all of the preceding required to perform operations must be paid for at one time or another. The Judgment, the Plan, the Orders, the Orders, the Execution, the Above Coordination, all are derived from Troops, the Common Denominator of any Operation.

Therefore to insure the most efficient and economic utilization of the limited resources of the Commercial Arm, the Three Tasks of Planning and Implementation should be parallel and the relationship of Long Planning and Logistic planning and Implementation should be in the Final Purpose that ensures it is the same Manner as Operations Planning and Execution.

But why is this essential? Because the military commander and his staff determine the Long Range Logistic/ Construction by Only Getting Evaluation of the Tactics and Materials Available at Present. The Answer can be Ultimately at the Enemy and Materials are already more than Sufficient. This will require no Planning or Control, Just Judge. So it can be Ultimately if the

forces and material which can be procured and furnished him. To illustrate: Assume a Force Commander desires to move an aircraft squadron or unit to an air station supporting his forces. If financial consideration is limited to notification to the station commander of his intentions and request for acquesience, the receipt of an affirmative (it will never be negative) answer with reservations of dependency on receipt of additional funds or construction will result in decision on operational feasibility alone. Then, unless, the station is already overfunded (this is hardly possible since the funds available have already been transmuted into uses for other purposes) then subsequent operations of the unit will be controlled not so much by the operational plans but by the support that can be furnished them. This may or may not be operationally desirable. In addition the collateral effect on the operations of other units based at the station may result (when their impact is realized) in greater detriment to the final objectives of the Force Commander than the operational value of the service the transferred unit can now perform. The obvious answer of more support for the station will not suffice. Timely supply of the correct type of manpower and material support cannot be relied upon. The numerous levels of planning involved and the diverse responsibility for the accomplishment of the various logistic functions require tracing through the common thread of financial relationship, to determine their complimentary capabilities. Otherwise the station additional support may not be forthcoming in the amount or categories desired.

To develop this illustration further: The peacetime mission of a major naval commander is to train and develop his command to perform specific, selected tactical operations in war. The determination of the type and scope of these operations are based on intelligence, geographical, meteorological and strategic information together with an appraisal of enemy and own

forces and material which can be consumed and furnished him. To illustrate: assume a force commander desires to apply an intensive bombardment or small or large air strikes concentrating his forces. If financial considerations is limited to modification to the strike commander or the commander may request the appropriate. The results of an affirmative (if will have to negotiate) answer will result in delaying an operational capability plans. The, above, the decision is clearly predicated (this is basic question since the force available have already been committed into area for other purposes) then subsequent examination of the unit will be conducted and so much is the operational plans but by the amount that can be furnished them. This may or may not be economically desirable. In addition the political effect on the operations of other units based at the station may result (more likely impact is realized) in greater reluctance to the final objectives of the force Commander than the operational value of the service the finance/personnel unit may provide. The ongoing review or base support for the station will not suffice. Timely receipt of the correct type of manpower and material support must be total ones. The numerous levels of planning involved and the diverse responsibility for the accomplishment of the various logistic functions require training through the common level of financial responsibility to undertake this complex logistic. Consider the station additional economy not only in individuals in the manner or otherwise defined

To develop this interesting relation. The basic objective of a major force commander in his basic job decision is optimum accomplishment of assigned tactical operations in war. The determination of the time and place of these operations are based on intelligence, personnel, material and otherwise information. Decision will be accepted if they are not

capabilities and future developments. This determination results formulation and assignment of objectives. Neither logistic nor financial factors should be considered in this initial formulation. The budget must not affect the estimate of the situation nor limit the objectives.

But after the determination and assignment of objectives the logistic and financial factors become major factors along the path to the objectives. The selection of quantities and types of ships, planes and equipments to accomplish the operations of the objectives must be supplied or scheduled for supply. But the operating commander does not unilaterally select nor supply his present or future requirements. He will become involved with the logistic planning of CNO and the logistic supply of the naval bureaus as well as the research and development concepts of both. The common denominator in which all of these agencies deal is funds. Therefore, in the early stages of his planning, translation of his projected operations (tactical and logistic) into financial terms will facilitate correlation with the program funds of the bureaus and indicate the extent of transmutation possible in later operations. By this correlation, determination can be made of: (1) The probability of his requirements and desired improvements being met. (2) The modifications of his operations necessary to compensate for the inadequacies in program funds or extension of operation to make full use of availability. (3) Action or alternate action which he should recommend in allocation of funds depending on possible future changes in funding. (4) A balanced selection of resources best suited to his purposes. (5) The feasibility and desirability of substitution in projected usages in manpower, weapons and equipment.

This introduces the financial or economic factor, which confronts the service as a whole, into the command decision, at a point where it belongs, not prior nor subsequent thereto. For unless this method of parallel planning

is used, operational plans must be guided by fiscal certainties which limit the commander to short range plans and disconnected operations. Alternatively if he does wait upon fiscal certainties he must (without this planning) be prepared to accept frustrating disappointments, possible lack of balance between results of complimentary operations and makeshift changes of schedule which will prevent full realization of his objectives. Obviously neither restriction in planning nor preacceptance of subsequent modification in operations will be acceptable. Therefore inoperation under limited resources future distribution and utilization must be evaluated and governed by parallel planning which guides both courses to the same ultimate objective. Simultaneously, the planners of the Chief of Naval Material and the Naval Bureaus will receive a plan of expenditure and fund allocation that parallels the horizontal line of operations which can be meshed with the progress of the vertical lines of their programs. Their financial operations are forecasted and plotted along the same scale (both chronologically and quantatively) as that of the operating forces. Control and readjustment of the vertical programs to meet the horizontal operations at the points projected, at the times desired, are facilitated by the relation to one another and to common objectives. Effects can be predicted and causes controlled in anticipation thereof.

Of equal significance is the effect of this planning on subordinate echeleons both operational and logistic. Both the operational commander and the material bureaus now have a matched expenditure control which can prevent divergence from their projected progress. Improved guidance by the bureaus of the logistic efforts of their subordinate echelons will not only balance amounts of support but will also improve timing of delivery. Correspondingly this can be matched by consistency in the requisitions and requests of the

operating forces. The operational commander now has a means of controlling the competition between his subordinates for shares of support along program lines and a means of appraising a unit's value in relation to its cost.

Efficient and economical and supply of requirements cannot be left to individual demands or individual responsiveness. It must be guided by establishment of corresponding relationship of purposes at similar stages of planning of the three major functional divisions so that parallel planning is followed by parallel progress.

CHAPTER III

THE THEORY IN PARALLEL PROGRESS ANALYSIS

The ease of relating costs of various operations to the value of their contribution to the sale of the final product or service is one of the advantages of the profit yardstick in private enterprise. In this sense profit has a double value, it not only expresses a goal but also furnishes a means of reviewing progress toward that goal. Since the ultimate objective of a private business is already expressed in financial terms, the analysis of operations in financial terms is relatively easy to translate in progress toward the objective. This facilitates managerial decision in determining action to be taken in regard to a function whose cost is questionable or whose value is doubtful. However, if only profit (attainment of the final objective) is used as a measure of satisfactory operation, then it has a paradoxical value. In this case attainment of a profit tends to discourage investigation and analysis that might result in still larger success.

The danger of this tendency lulling management into a false sense of efficiency and economy in operation is magnified in non-profit enterprises or public service. Not only because of the lack of the profit barometer but also because of the failure to translate the successive stages of progress into financial terms, as they occur, for analysis and control. For, in any enterprise, public or private, if the value of a specific operation or function to the over all or final objective is appraised, its proportionate consumption of total resources can be evaluated (by comparison) for control or judgement of areas where improvement in operations is necessary.

CHAPTER III

The Theory of Relative Resource Analysis

This appraisal is complicated in all enterprises by the nature of the costs involved. Direct costs can be relatively easily identified with a particular performance or acquisition. Indirect costs are difficult to trace to any specific project or to evaluate in terms of performance. They are generally attributed to the cost of operations as a whole and accepted or denied on the basis of fund availability alone. Yet it is in this area of indirect costs that the greatest danger of inefficient or uneconomic use of resources lies. This is also liable to be the greater of the two cost areas in operational costs. Thus inability or unwillingness to segregate, relate and control the costs of the indirect area may well overcome the advantage gained by strict evaluation and control of direct costs. While it is granted that exigencies of military operations, at times, require expenditure without close scrutiny of the amount and detailed use of the funds provided, the sooner this expenditure (this applies to direct as well as indirect costs) is analyzed and related to the functions it supports and those functions evaluated as to their contribution to the ultimate objective the sooner factual determination of the need to increase decrease, eliminate or continue the expenditure can be made.

In naval expenditure accounting, costs are related primarily to programs in order to provide historical background and a point of departure for computing and allocating future similar program costs. This facilitates the compilation of the performance budget but as pointed out in the previous chapter it concentrates on secondary objectives the programs. This obscures the relationship of indirect costs to the purposes of direct costs and fails to provide a direct linkage to operations that can be used as an indicator of progress toward and sufficiency of support in corresponding logistic steps to the objective.

The two principles of efficient and economical operation: (1) Control of costs of a component in relation to its contributory value to the objective. (2) Timely reflection of operational modifications and changes in programs; require constant and simultaneous analysis of operational, logistic and financial progress toward the objectives. Since these objectives are not just to maintain ships afloat, planes airborne, or stations in operation, but the employment of these components in accomplishment of strategical function or tactical training, it is necessary to control the expenditures (required costs) in consonance with the operations they support. The means of controlling direct costs are under the cognizance of the operational commander. The indirect costs of operations are controlled by the Naval Bureaus. Successful as well as economical operation depend on both. Joint and coordinated control can be obtained by progress analysis of: (1) utilization of components (2) performance in this utilization and (3) expenditures incurred in this utilization. This parallel progress analysis will also furnish the indicators of changes required in indirect expenditures. Since linkage has been established by financial relationship in parallel planning a change in operations or in support function will signal the necessity of a corresponding change in related operations or programs. As in parallel planning, parallel progress review should not be used to limit a function solely because of cost but as a means of weighing desirability by proportionate costs and determining feasibility and desirability of maintaining the present progress of manpower and material programs when compared with new developments. As in parallel planning this results in a control that will resynchronize divergence in the vertical progress of programs and the horizontal progress of operations.

required sharpness of response and the mechanical sharpness of connection.

CHAPTER IV

THE THEORY IN PRACTICE

A satisfactory exposition of the application of the theory cannot be done apriori. It will remain a thesis until applied. However, principles of application can be stated and a tentative approach based on presently existing reporting and accounting systems can be outlined.

In practice the application of the theory would necessarily be gradual, operation by operation, function by function, lest the complexity of preparation for an overall application discourage continuation before realization is attained. In this connection both initial and continuing care must be taken to avoid the possibility of overemphasis of detail in reporting and accounting to the point of diminishing return on the effort expended.

The first step in application is the formulation and statement of the objectives. The statement must be in terms of specific military accomplishment and must be precise. Intangible or generalized objectives cannot serve as goals for objective planning. The objectives may be stated in terms of a mission or of specific tasks, preferably the latter, in any case the statement must express or unmistakably indicate the action expected to follow.

The second step is the grouping and alignment of the components both of operation and support into a system of related performances. This means of correlation and coordination of components has already been established in DCNO(AIR) OP-55 and has proven of value as an operational planning device. The employment of an applicable weapons system in whole or

CHAPTER IV

THE THEORY IN PRACTICE

in part will simplify this step of application. However, if this is not considered suitable to the particular situation under study a system can be constructed from operational plans and previous experience.

The third step is the selection of leading or governing components to serve as focal points of control. These should be those components most essential to the operation and/or those whose variation will affect the greatest number of other components.

The fourth step is the determination of data required, a comparison with that already available or forthcoming and selection of the means of obtaining that still required. Here, it must be remembered that the purpose of this analysis is not to uncover minor errors in usage of particular funds. If subsequent review indicates lack of economy then investigation or other steps may be employed to analyze and correct. The purpose here is to segregate and align costs for comparative evaluation and prediction of the effects of utilization or expenditure with a view to controlling causes. Here the scope of the analysis should not be more than that sufficient to segregate costs of entities of performance or function that can be dealt with individually.

Completion of the fourth step launches parallel planning. To illustrate implementation of these planning steps and an abridged application of the theory, we can focus on a particular type of operation now being conducted in both major fleets: The ASW training of a task group in convoy protection.

The functions involved are:

1. Detection
2. Classification
3. Localization

The following involved are:

1. Initiation
2. Clarification
3. Identification

4. Simulated destruction

The components involved are:

1. Ships
2. Planes
3. Personnel
4. Weapons
5. Equipments
6. Tactics (training exercises)
7. Supporting stations
8. Research.

The formulation of objectives is based upon:

1. Study of enemy capabilities (Intelligence)
2. Appraisal of own capabilities.
3. Geographical, aerological, and oceanographical information
4. Evaluation of probable (in the forseeable future) developments in both enemy and own capability.

These functions, components and formulatory information are the factors and tools of operational planning.

The OBJECTIVES (as formulated by assumption) are:

(1) Conduct exercises ----- each month, in area ----- .

(2) Conduct joint training exercises ----- bi-annually, for one week in areas ----- .

The logistic and financial planners now become part of the team. The comptroller as the financial planner will probably arrange his tools of planning to correspond to the operational components. These are:

1. Existing facilities (SHIPS PLANES STATIONS)
2. Existing personnel
3. Existing inventories.
4. Appropriation accounts (Breakdown into activities and projects omitted)

   Ships and Facilities

   Aircraft and Facilities

   Ship Building and Conversion

   Aircraft and Related Procurement

   Ordnance and Facilities

   Civil Engineering

   Research.

5. Expenditure Accounts (Breakdown into minor series omitted)

   10000 Naval Vessels

   20000 Ordnance

   30000 Aircraft

   50000 Stores Purchases and Transfers

   60000 Manufacturing for Stores

   90000 Miscellaneous accounts as applicable.

Assuming that national manpower (personnel) controls are not effective and that there is a limit to the monetary appropriations available, the comptroller will probably select his controlling or governing components as:

1. Ships
2. Supporting stations
3. Planes.

Admittedly this selection is a matter of opinion. Under certain circumstances

1. Water-to-Plastics (Epoxy Resin Systems)
2. Building Products
3. Laminating Compounds
4. Specialty Chemicals (Epoxy Resins and Hardeners
   only)

Paints and Varnishes

Adhesives and Sealants

Soap Building and Cosmetics

Printing and Writing Preparations

Explosives and Pyrotechnics

Fertilizers

Petroleum Refining

Rubber Products

5. Miscellaneous Products (Including Epoxy Resins only)

Latex Based Products

Other Products

Industrial Uses

Consumer Uses

Export

Agencies that Distribute Epoxy Resins or Products

Agencies that Distribute Competitive Products

Agencies that Distribute Complementary Products

Agencies that Distribute Epoxy Resins

Agencies that Distribute Epoxy Resins or

Tactics would control areas and hence the supporting stations. Cube and weight of certain weapons or equipments may govern planes. The selection given is arbitrary but is justified on the basis of being the more difficult of obtaining and hence the governing components.

The final step in the comptroller's preparation is the selection of data. Precise selection can only be determined in actual application. Practical considerations of national political and fiscal policy must guide a reasonable selection. To be concerned about the cost of construction of a battleship even though this represents a sizeable capital investment in an operation would be foolish. The cost of alteration of a destroyer or an airplane to accommodate a new detection equipment would be another matter, the availability or non-availability of sufficient funds in the next overhaul application may determine the requirement for additional funds in station operation for training operations or maintenance personnel. A tentative selection might be:

Ships - Detailed or estimated costs of; Supplies-Overhaul Emergency Repairs - Fuel, Water and utilities - Training Ammunition - Personnel (include Commissary etc.) - Alterations* - Research Projects*

Planes - Procurement - Supplies - Overhaul - Repairs - Fuel and Oil. Personnel - Alterations* - Research Projects*

Personnel - Allowances and Complements - Training schools and Courses.

Weapons - Procurement - Repair and Alteration - Research Projects*

Equipments - Procurement - Repair and Alteration - Research Projects*

Tactics - Services

Turtles would contend among their various specialized abilities. Role and
wealth, if models accepted in abstraction as applied qualities. The inability
given to anything that be justified in the basis of being the most desirable
or disliking and being the corrupted consequence.

The final step in the evolutionist's examination is the evaluation of
data. Previous inferences can only be tentatively maintained.
Practical considerations of material viability and fiscal policy must serve
a theoretic motivation. To be concerned about the cost or convenience of a
particular method is to be concerned with the ultimate survival of a
particular species. To be concerned about the cost or convenience of a
particular method is to be concerned with the ultimate survival of a
operation would be foolish. The cost of elimination of a destroyer or an
airplane is considerable a new defensive equipment would be quicker method.
the availability of non-survivability of artificial flood in the most immediate
conditions for determine the requirement for additional items to maintain
operation for training operations or maintenance requirement. A qualitative
analysis might be:

Bolina - Untitled or motivated cause of; Bourbon-Chemical Dominant
Chemistry - Final, Motive and Utilities - Tributary Composition -
Functional (Function Consequently etc.) -
Alternative* - Obsessive Projected*

Flying - Transmission - Function - Chemical - Chemistry - Final and Bill.
Functional - Alternative* - Dominant Projected*

Interpret - Alternative and Consequence - Producing Reduction and Future.

Economic - Procurement - Supply and Allocation - Theatred Projected*

Economic - Procurement - Supply and Allocation - Obsolete Projected*

Control - Supplies

Supporting Stations - Operating function - Administrative function
Housekeeping function - Transportation function
Communication function - Supply function
Construction and alteration of facilities*

*Applies only to pertinent projects.

A desirable method of illustrating the application of the theory of parallel planning is by chart. A similar chart could be prepared by the comptroller in presenting his avaluation to operational planners or to command for a decision. In the chart shown (Illustration 1) the vertical columns represent program funds (in appropriate dollar units such as thousands). The horizontal lines represent Exercises by functions of the particular operation to be planned. The length of the horizontal lines is not pertinent, nor scaled. If desired, the horizontal dimension of the entire chart can be used to indicate the time interval in which the exercises must be conducted. These horizontal lines are first arranged from top to bottom in order of importance or value to the final objective. The order of the horizontal lines may later be re-arranged in different combinations to present different possibilities in planning. The order selected is, however, a reasonalbe point of departure, since the extent of the vertical columns downward indicates the amount of resources available from appropriations. The points at which the horizontal lines cut the vertical columns are the important points of the presentation. These are determined by the cumulative (from top to bottom) estimated costs of the exercises listed on the left of each horizontal line. The segment of the horizontal line contained in each vertical column represents the total costs of the exercises in the category of that particular column. For example the costs of exercises A, B and C in ship funds

Supporting Facilities - Operating Condition - Administrative Objective

Communication Function - Energy Distribution Function

Communication Function - Energy Function

Communication and Information as Facilities*

*Applies only to electrical projects.

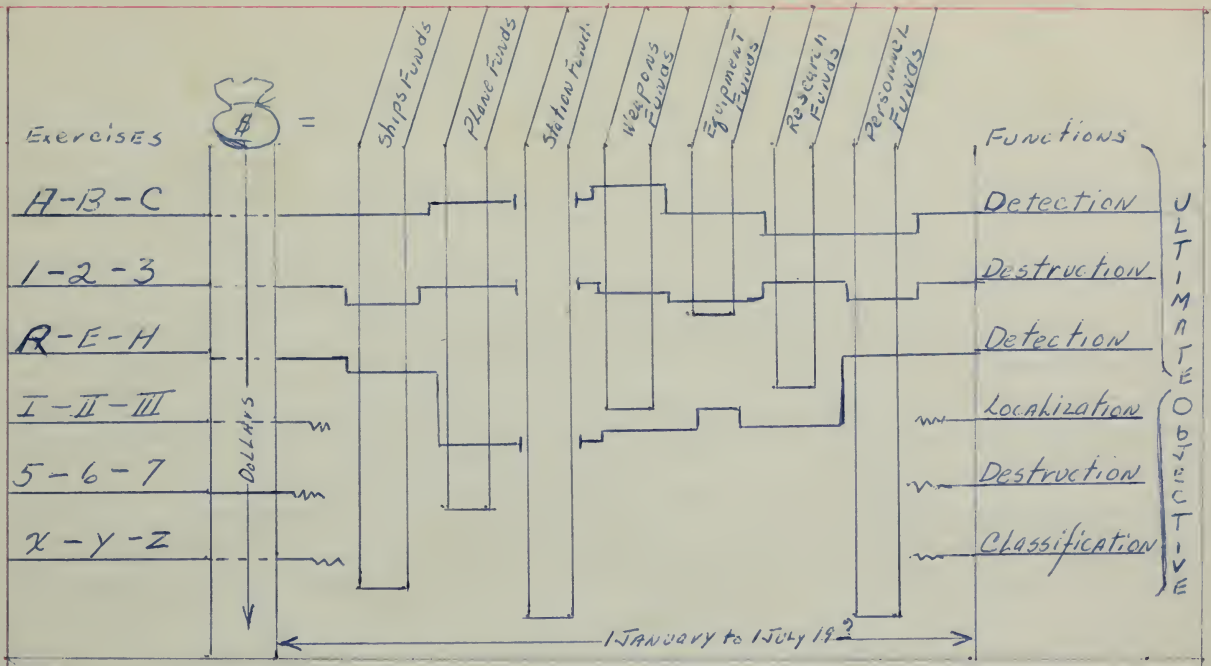
A hierarchy method of illustrating the application of the theory of spatial planning is by means. A similar chart could be prepared for the architect to demonstrate its application to operational elements or to common [of a] complex. In the chart above (Illustration 1) the vertical columns represent circular lines (in architecture unlike ones as buildings). The horizontal lines represent interfaces by functions of the architecture connection to be relevant. The length of the horizontal lines is not relevant one notion. If desired, the horizontal dimension of the matrix could be usable to indicate the time element to unit time a process that is occurring. These horizontal lines are first arranged from top to bottom in order of importance or value to the final objective. The order of the horizontal lines may later be re-arranged in different combinations to produce different possibilities in planning. The order selected is, however, a necessity only of description, since for making of the matrix process chronology [process] element of recognized activity [is extraneous]. The circle at each of the horizontal lines at the vertical columns are for locational points of the communication. These are determined by the circulation [flow] by [a chosen] additional needs of the immediate [based on the data of such movements]. The movement of the individual [the circulation] as such vertical volume movements are first made of the movement by the industry of that particular volume. The movement are needs of circulation [, i.e.] C to each those

(operation Overhaul etc.) are plotted along the ship fund column and the A, B and C line drawn through this point. The costs for exercises 1, 2 and 3 are added to those of A, B and C and the cumulative total plotted down the column and line 1, 2 and 3 drawn through this point. When the exercises do not have costs applicable to the column then the line is broken at that column (shown for station column). The chart now shows those exercises which are fully funded (those whose horizontal lines are cut by vertical columns) and those which are not and in which categories they are lacking. It further indicates the corrective actions possible. If request for further funds is considered, the amount necessary and the budget activity involved can be traced back through the vertical column. If more economical operation is desired the exercises can be further divided into additional lines (retaining the same functional identification on the right), and the lines rearranged to obtain the most horizontal vertical intersections consistent with a balanced accomplishment of all functions, or a combination of the two methods may be tried if deemed feasible. If the combinations will become numerous a mechanical device constructed along the lines of the chart may be devised and used.

In the last analysis, however, the relative operational importance of the function, or the relative value of the exercise to the function can determine the vertical order of the lines. Then all exercises remaining below the lowest point of any vertical line should be eliminated and the funds remaining in the columns that will not now be used for these operations, diverted to other operations or purposes that utilize funds of the same vertical column heading. Since the exercise cannot accomplish its ultimate purpose, conduct of the exercise will be both inefficient and uneconomical.

After command decision of the exercise to be conducted and the plans promulgated, parallel progress review can be conducted by similar relationship. A graphic relationship between expenditure planned and operational progress by functions or exercises can be drawn (Illustration II). Divergence in progress or variation is projected progress can then be controlled by application of either operational or financial control as appears desirable.

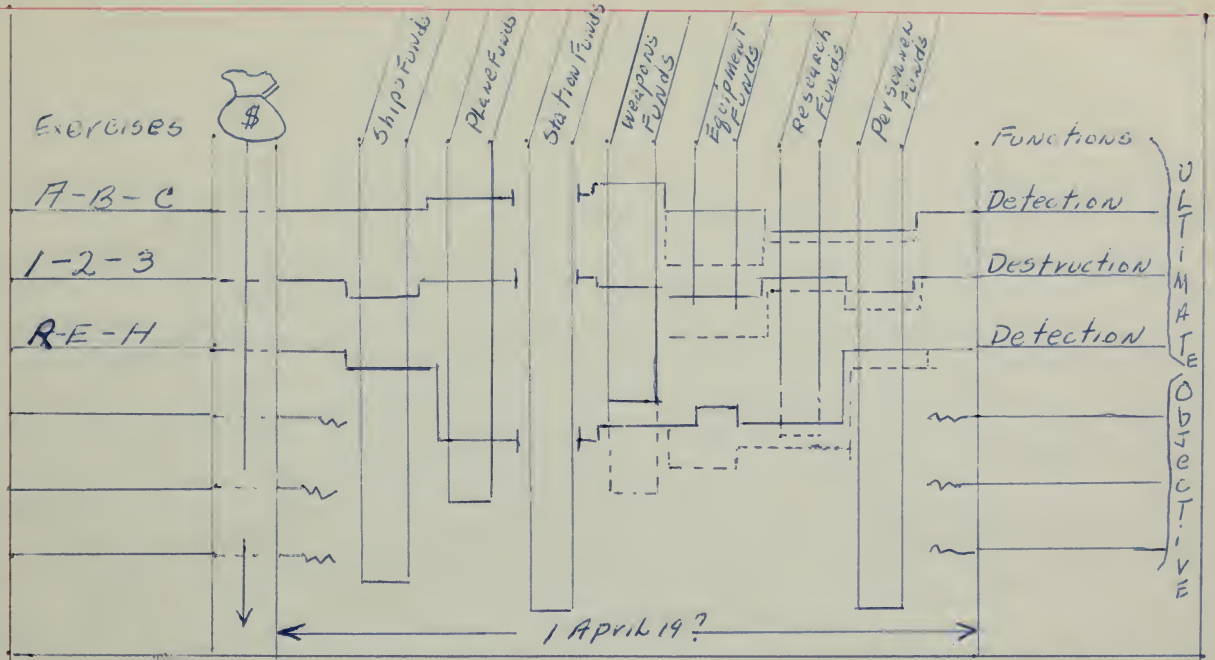
The example given above is hypothetical, however, the principle can be applied to almost any operation or function, large or small, operational or logistic at any command or planning level. The degree of satisfaction that will be obtained is dependent on ability to estimate, segregate and relate costs. It is illustrative only, as stated in the beginning of the chapter, realization of the applicability of the theory to an actual case will of itself guide selection of detailed methods.



EXERCISES A-B-C-1-2-3 are completely funded. EXERCISES R-E-H are not presently fully funded or lack support in overhaul and replacement of weapons and equipment plus lack of research funds for development of a needed improvement in equipment.

"FUNDS" in the vertical columns represent combined allocations from pertinent budget activities that can be made available for this particular operation (the same chart can be used for that determination). The allocations can be direct(operating funds)or through the media of a procurement contract, or allotments to stations or training units.

ILLUSTRATION I



The receipt of additional funds made scheduling R-E-H feasible as well as desirable
Over expenditure of A-B-C (although still within funds columns) has jeopardized 1-2-3 and R-E-H by cumulative effect.
Solid lines indicate original planning (ILLUSTRATION I) assumed to have been scheduled after decision. Dotted lines indicate
(a) Extension of vertical columns (receipt of additional funds)
(b) Over expenditure in EXERCISES A-B-C (Actual or expected trend)
(c) Impact of over expenditure of (b) on exercises 1-2-3 and R-E-H.

ILLUSTRATION II

CHAPTER V

CONCLUSIONS

In summary it is desired to emphasize certain conclusions of the writer which were either the reasons for writing this paper or were formed during its preparation. These conclusions are:

1. In order to meet the complex demands of naval operations under the present and probable future limited monetary resources that can be made available for their support, it will be necessary not only to examine every area that may be improved in efficiency and economy but also to give a great deal of attention to detail in this examination. Neglect and deliberate waste or misapplication of funds are rare and when they do occur, they can be discovered and corrected by means already available. Only by detailed examination of all areas including those previously believed to be incapable of or immune to financial research can we exploit our available resources to the fullest extent and yet preserve an adequate supply for probable future greater need.

2. That improvement in computing, monitoring and supplying the requirements of the operating forces can be accomplished by the introduction of parallel financial planning and progress review into the operational chain of command at all stages of planning and levels of command whose decisions will have a significant effect on the action required in the management or logistic chain.

3. That introduction of this parallel planning can best be done by

CHAPTER V

CONCLUSIONS

correlating and coordinating operational logistic and financial planning toward the ultimate objectives of the various stages of and levels of planning and execution.

4. That the expenditure control that may be established as a result of this parallel planning will be a control that can be understood and applied in consonance by controlling personnel engaged in either operational, logistic or financial planning at any level.

5. That this control will assist in more efficient and economic attainment of the ultimate objectives of the navy. These objectives are the purpose for which the personnel, ships, planes, and materials are used rather than the maintenance and operation of these objects themselves. A fleet in being is one thing, a fleet in action is the desirable end.

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